

*Branding Statement*  
*Tej Chajed*

**Brand:** I'm the systems verification person.

**General problem:** Even critical systems software still has bugs. Testing can help increase confidence in a system's correctness but can't find all the bugs in a realistic system.

**Specific problem:** Storage systems are particularly difficult to make correct because they need to have concurrent and performant implementations, but they are also important since applications rely on them to store data. I apply formal verification to prove that a storage system's implementation always behaves as intended, even in the face of concurrency and if the computer crashes in the middle of writing data.

**Achievement:** I wrote DaisyNFS, a concurrent file system that has performance comparable to Linux and comes with a machine-checked proof that it implements each operation atomically and correctly. DaisyNFS uses a new verification approach that combines interactive proofs of a concurrent transaction system with more automated proofs of the transactions themselves.

**Vision:** I plan to continue to push the boundaries of systems verification along two particular axes: 1) scaling to larger systems, which will benefit from combining automated and interactive verification techniques and 2) defining new types of specifications and developing techniques to prove them, for example to address security properties.